BMP #37 - Planting

Targeted Pollutants

- ● Sediment
- ◒ Phosphorus
- ◒ Trace metals
- ○ Bacteria
- ○ Petroleum hydrocarbons

Physical Limits

Drainage area	unlimited
Max slope	50%
Min bedrock depth	3 ft
Min water table	3 ft
SCS soil type	ABCD
Freeze/Thaw	fair
Drainage/Flood control	no

DESCRIPTION

This BMP fact sheet describes the process of establishing vegetation by setting out plants that have been grown to a specified size or age. The plants may be potted in plastic tubes or in containers of various sizes, or root wrapped, or may be bare root stock.

Plantings are often specified for aesthetic purposes (landscaping) but can serve various erosion control functions as well. The living trees and shrubs in a planted area will grow large enough to provide soil stabilization and erosion control benefits sooner than the seeds of woody species can germinate and grow to effective size.

The use of trees and shrubs also provides greater aesthetic and biological diversity and, in many areas, is more compatible with vegetation on lands adjoining the planted site.

Also refer to Appendix F for additional design guidance regarding using landscaping to maximize water quality benefits.

APPLICATIONS

Planting is the preferred method of revegetation in many situations where seeding and other slope treatments are either not effective or not appropriate as permanent measures. Such areas may include:

- Any finished slope that will remain undisturbed for at least ten years, especially if the area is bordered by forests, wetlands or other naturally occurring woody vegetation. On such sites, trees and shrubs may be the desirable vegetation from a long-term perspective, but may be very difficult or unreliable to establish from seed.

- Extremely rocky slopes or sites. If natural vegetation is present in significant amounts, such areas are difficult to seed and mulch effectively. Plantings can be used to provide additional stabilization.

- Streets or materials source sites that have been abandoned permanently.

- All types of landscaping, including urban thoroughfares and interchanges, and residential streets where landscape aesthetics are a concern.

- Wetlands and wildlife habitat areas: in such areas, it may be critical to plant the desired species initially, so that the site is not overrun by weeds or undesirable plant species that detract from the intended use of the site.

- Areas where the higher rate of transpiration for trees and shrubs (compared to grasses and forbs) helps remove excess moisture from the soil.

LIMITATIONS

- Purchase and installation costs are higher than for seeding.

- Continued or periodic irrigation may be required if planting occurs during dry season or on sandy soils. Watering may also be necessary up to two years after planting and during periods of drought or intense heat.

- Specific seasons of work apply for planting. Planting outside the designated season should not be allowed unless provisions for special care and maintenance of the plants are enforceable.

DESIGN PARAMETERS

Advantages of Planting: Many shrubs and trees are difficult to establish from seed in natural environments and natural seed crops vary widely from year to year. Rapid invasion from native vegetation and rapid establishment of sown seed of woody species is therefore unreliable. Vegetative plantings are used to provide living shrubs and trees that will grow to adequate size to provide soil stabilization and erosion control faster than seeds of woody species can germinate and grow to these dimensions.

Materials: Planted material may be grown from either cuttings or seed. At delivery to a job site, the plants may be potted (in containers), root wrapped, or bare root stock. Some species are successfully planted as sprigs or tubelings.

Use of Native Species: If possible, use species that are native to the area. Native species provide long-term soil stabilization which is aesthetically harmonious with natural vegetation and which requires little long-term maintenance. Short-term maintenance is necessary to ensure the establishment of the vegetation.

Maximizing Effectiveness: Successful planting projects depend on selecting suitable plant species, using healthy planting stock, and planting when the season and weather conditions are favorable. The site must be properly prepared for planting, and must be properly maintained after planting to ensure long-term survival of the plants. Make sure the contract and plans include adequate provisions for all aspects of the planting process.

Since vegetative planting places living plants on a site, thus decreasing the length of time necessary to establish a complete revegetation project, it is more effective than seeding methods for revegetation. Adequate maintenance is absolutely necessary to achieve this effectiveness since vegetative planting require irrigation for at least the first year, and will benefit from irrigation for two or more years.

Vegetative planting may be combined with seeded grasses and legumes which provide immediate surface coverage (see BMP #35-Seeding).

CONSTRUCTION GUIDELINES

Make sure that planting site are adequately graded and that tree locations and planting areas (for shrubs, vines, and ground covers) are marked and approved before planting begins.

Plant materials must be examined before use to ensure that species, container sizes, and root and soil condition are acceptable. If possible, the growth medium for containerized plants should be similar to the soil type on the revegetation site. Container size guidelines are as follows:

- Tree species may be of bare root stock or of potted stock. Pots should be one gallon (4 liter) size or larger.

- Shrub species may be of bare root stock or of potted stock. The preferred planting pot is a tube of woven plastic that is planted with the plant contained in it. The pot deteriorates over time. The pots should be 2 inches (50 mm) long, with both ends open.

- Paper pots must be 2 to 3.1 inches (50 to 80 mm) square and 8.5 to 12 inches (220 to 300 mm) long. The paper around the rim should be removed to ground level at planting.

- Peat pots are not recommended since research has shown greater mortality of plantings in peat pots due to drying. If peat pots are used, any exposed peat pot material showing after planting should be removed.

- In general, no container should be less than 2 inches (50 mm) wide and 6 inches (150 mm) deep.

Plant storage: Store bundled bare root planting stock, whether tree or shrub species, in a cool, moist place from time of receipt until time of planting. This time should not exceed 10 days.

Store potted planting stock in shade, out-of-doors, and kept lightly sprinkled with water to maintain a moist soil from the time of receipt to the time of planting. This time should not exceed 30 days.

Planting procedures:

- Plant the mixture of trees and shrubs that has been prescribed. In no case should this be less that 690 plants per acre (1,700 plants per hectare). If bare root stocks are used, planting rates should be increased by 1.25 times the stated rate.

- Voluntary or unskilled labor may be used in planting. However, a supervisor who is skilled in the techniques being used should direct the labor.

- Construct a basin 12 inches (300 mm) in diameter and depressed no more than 2 inches (50 mm) from the elevation of the downslope lip.

- Open the planting hole with a planting bar or shovel. Then place the plant near the downslope lip of the basin. This allows sloughing from the slope to fall in to the basin without burying the young plant.

- Carefully remove plants from their containers, if any, and place them in the planting holes so that the crown of the plant is at the surface of the soil. No air space should be allowed around the roots, nor should the roots be folded under. Plants in individual containers made of decomposable material are planted without removing them from the container.

- Apply fertilizer at the rate specified, and place wood chip or wood fiber mulch to a depth of 2 inches (50 mm) around each plant.

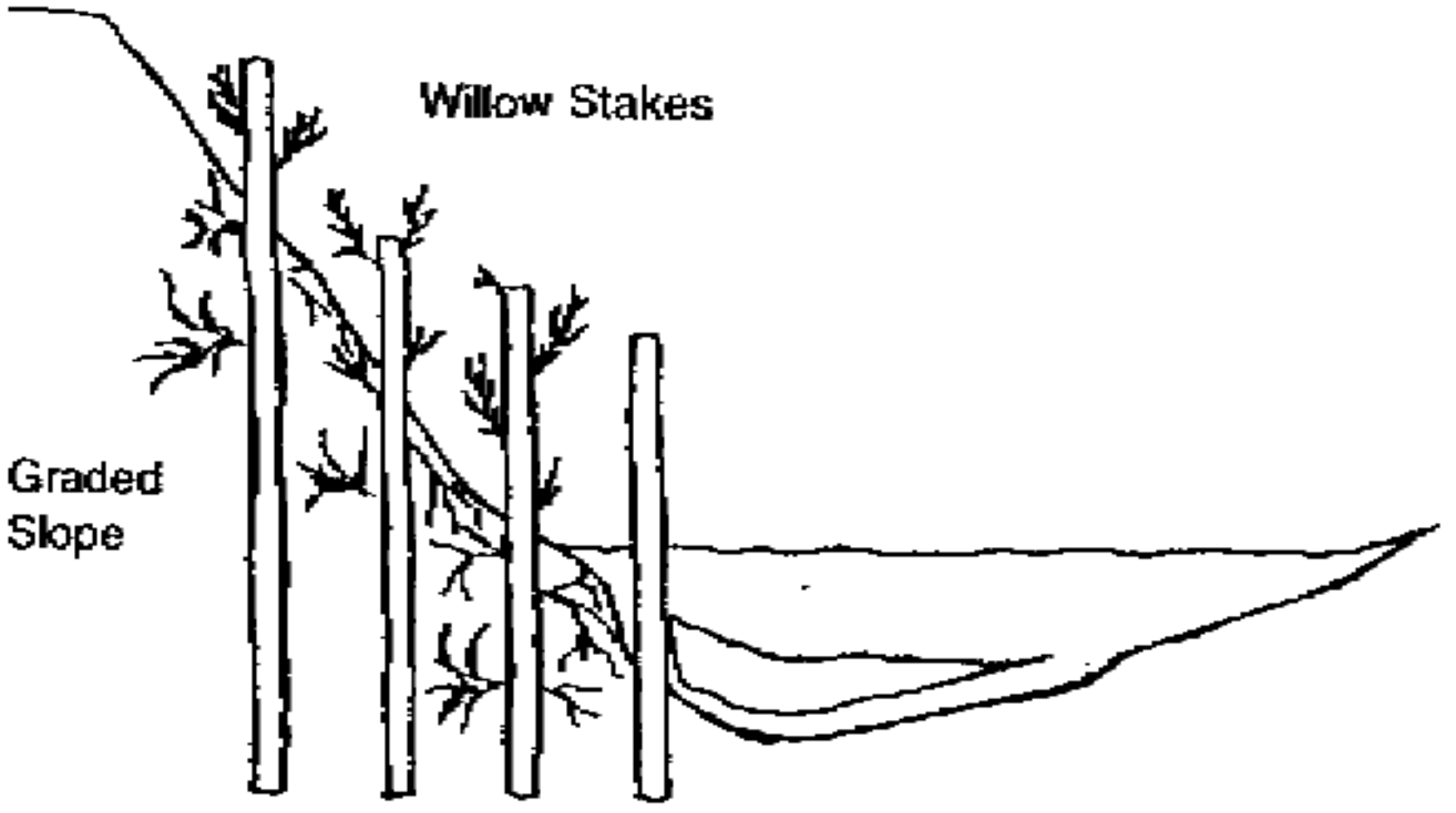
- The soil should be wetted to field capacity to a depth of 3.1 to 4 inches (80 to 100 mm) at the time of planting and each time the soil moisture level drops below the permanent wilting percentage.

MAINTENANCE

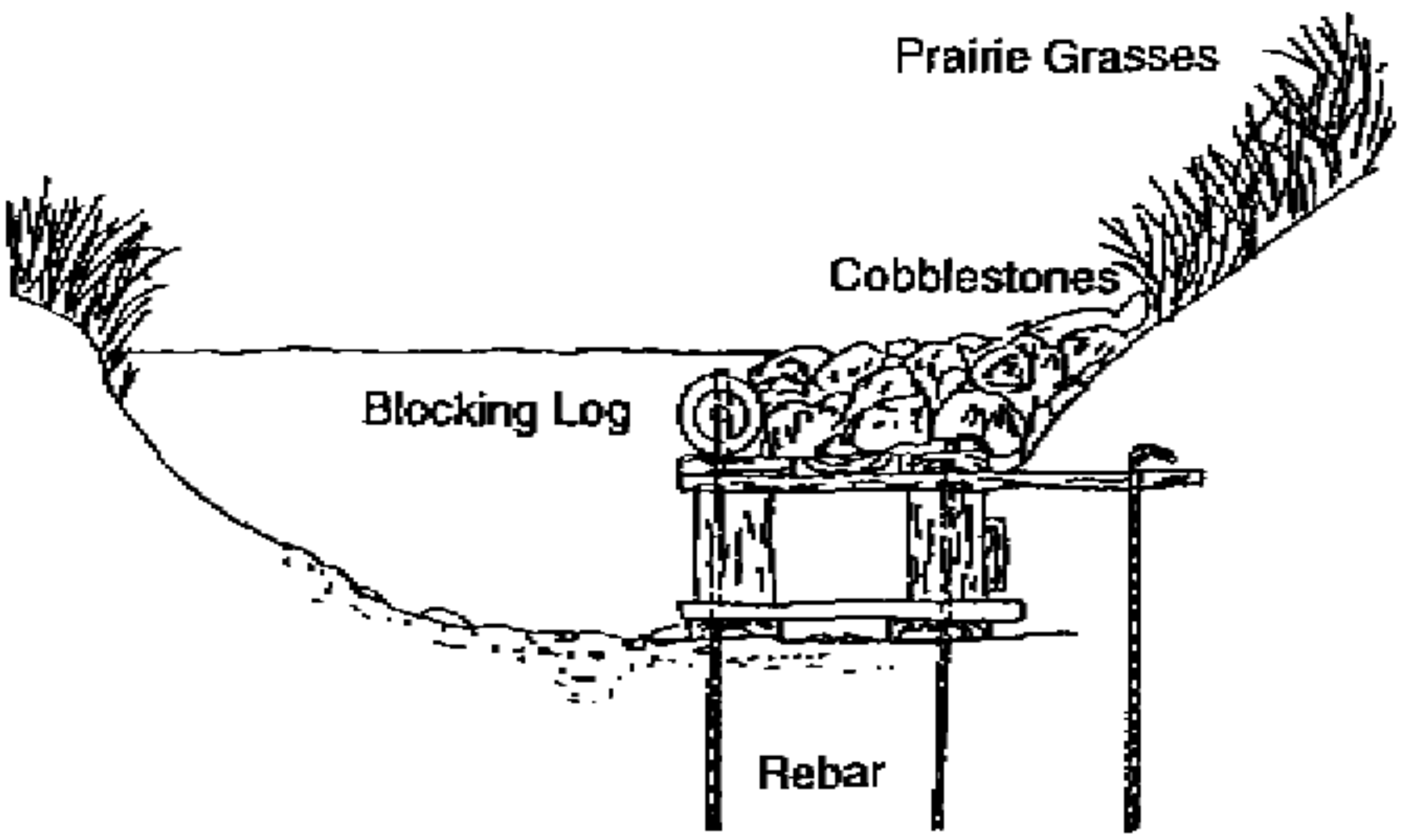
- Irrigation of vegetative plantings during the first two years following planting is required to increase the survival rate. Water as often as necessary during periods of intense heat or lack of rain.

- Inspect plantings frequently after first installed to see if plants are thriving. Remove and replace dead plants to restore the prescribed number of living plants per hectare.

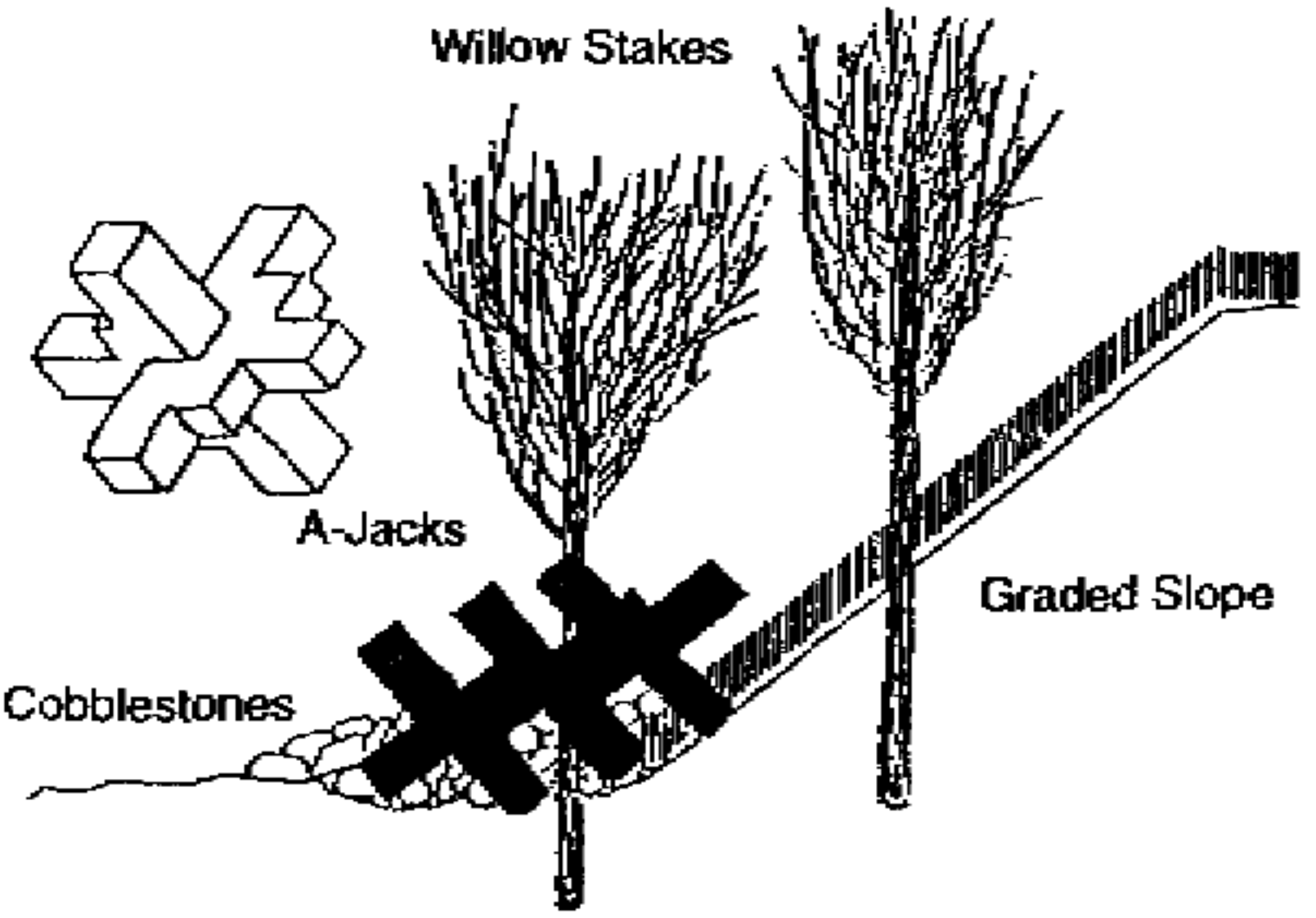
- After storm events, examine the planting basins and mulch cover and make any needed repairs.



Willow posts installed below depth of streambed scour.



Lunker with riprap below baseflow stage. Rebar is driven below bed scour depth.



A-jack bank structures.

Insert bar and push forward to upright position.

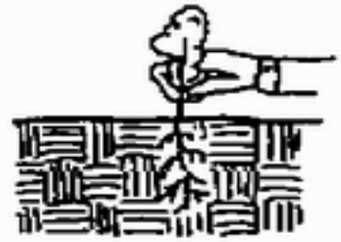
Remove bar and place seedling at correct depth.

Re-insert bar next to planting hole and pull away from seedling, firming soil at bottom of roots.

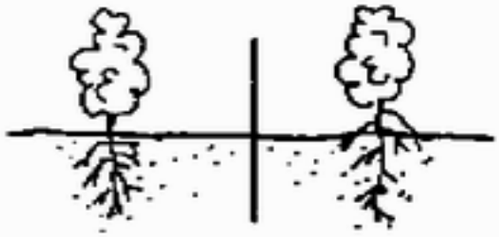
Push bar toward plant firming soil at top of roots.

Fill in hole by stamping with heel.

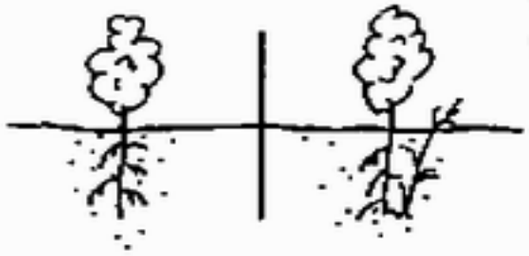
Firm soil around seedling with feet.



Test planting by pulling lightly on seedling.

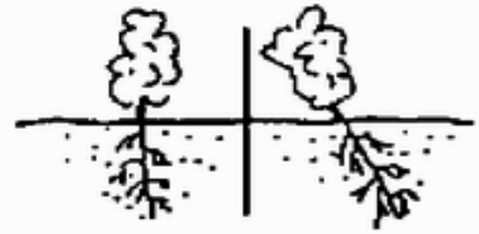


Right Wrong



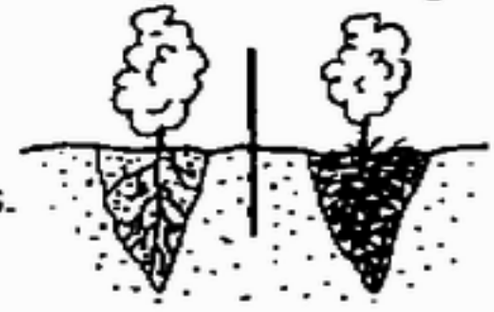
Make hole deep enough to accommodate all roots without bending.

Plant seedlings upright.



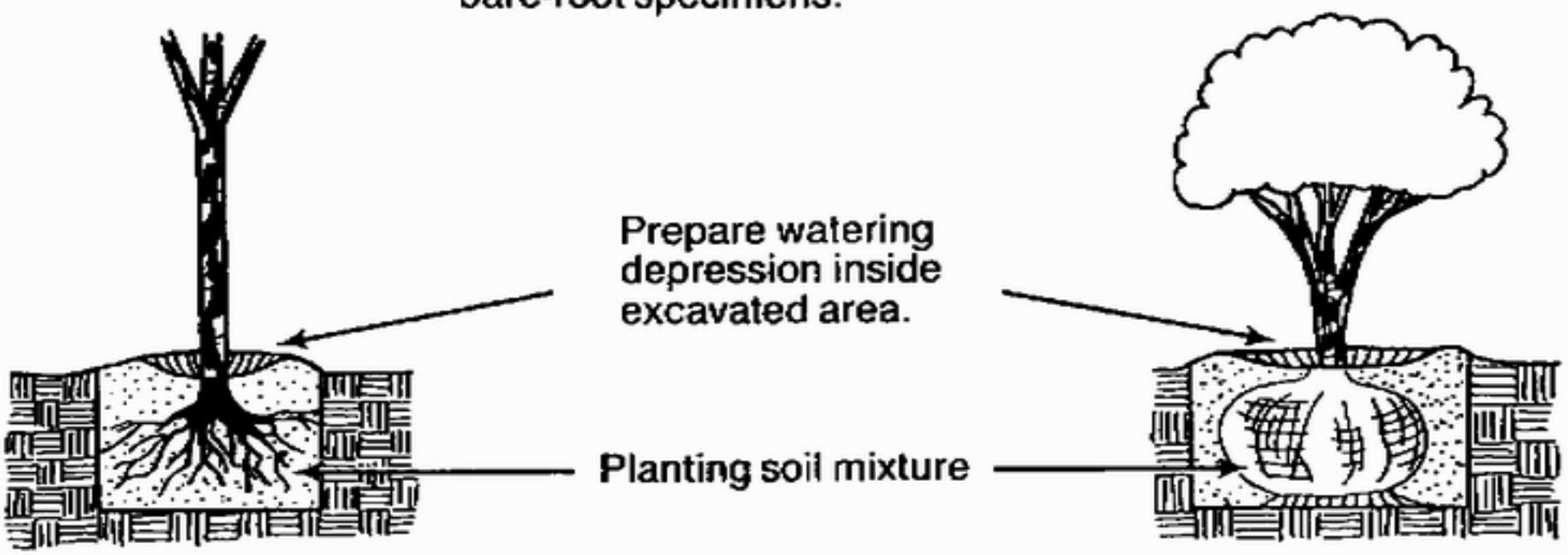
Right Wrong

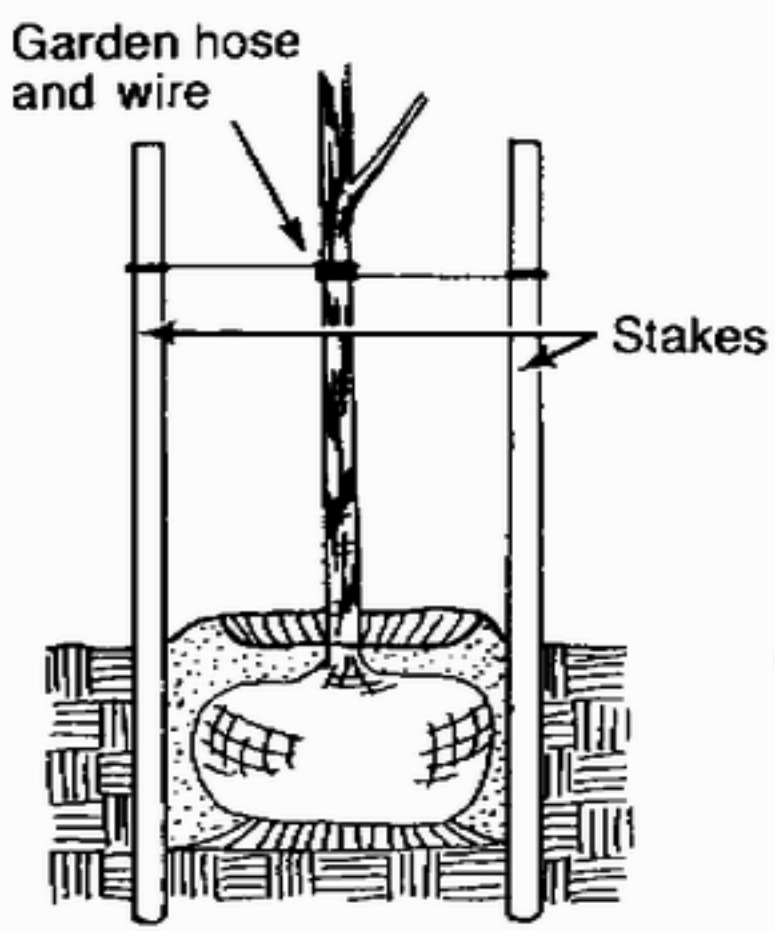
Always plant in soil—never leaves or debris.



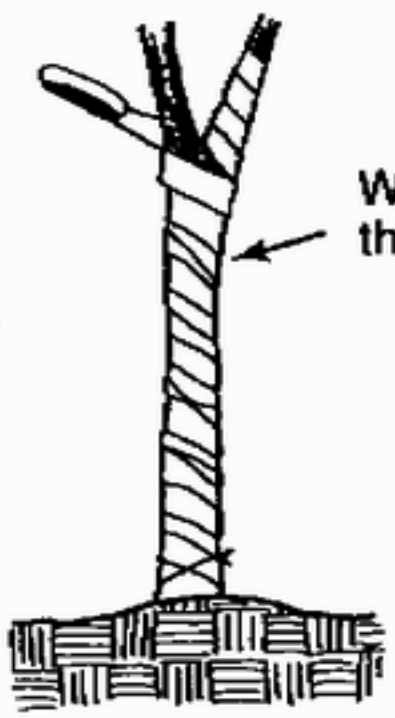
Planting bare-root seedlings (modified from Va. Div. of Forestry).

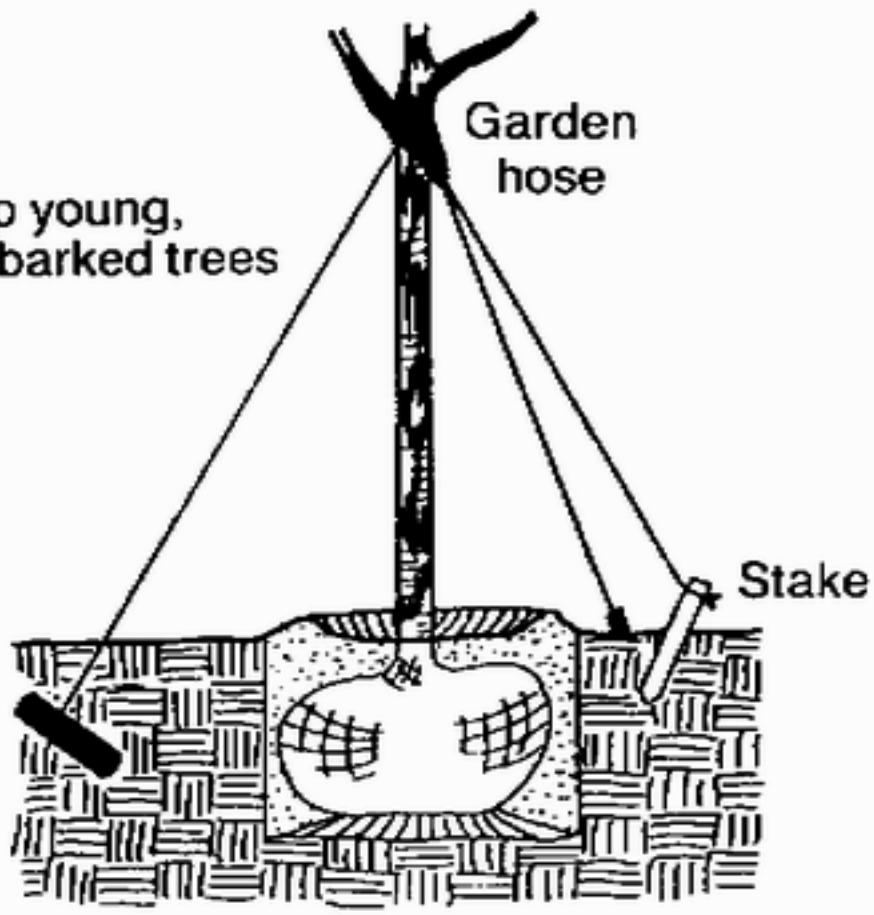
Plant at the same depth as when previously grown. Spread out roots of bare-root specimens.





Trees under 6'





Trees over 6'